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ABSTRACT

This paper discusses several applications of technology to facilitate better synchronous and asynchronous communication between faculty members and students and among students at Eastern New Mexico University's College of Business. Topics discussed include: (1) World Wide Web pages, including programming languages, browsers, and hyperlinks; (2) electronic mail, including interactive real-time chat (IRC); (3) listservs, including use for completing homework; (4) Web phones, including Microsoft's Netmeeting conferencing software and its use in instructional television (ITV) classes; (5) newsgroups, including newsreader software, using the DejaNews search engine to search for newsgroups, and use of newsgroups for various purposes in business classes (e.g., sharing information, reviewing for a test, answering questions); and (6) other, including use of the network drive for handing out/collecting assignments and experimentation with remoting software such as PC Anywhere. Related Web sites are noted throughout. (MES)

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Enhancing Student Learning Through Electronic Communication Technologies

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Communication is a key component in education. The ability of a teacher to effectively convey a concept to the student and for the student to be able to understand and synthesis what the teacher is presenting is of paramount importance. Often this communication is hindered because the teacher's style of delivery does not fit the learning mode of the student or the time frame in which the delivery is provided is not a productive time for the student. Educators are also aware that many students learn better through collaborative exercises with other students. The key ingredient is effective non-time non-space bound communication. Eastern New Mexico University's College of Business is using technology in various ways to help facilitate better synchronous and asynchronous communication between faculty members and students and communication among students. Several applications of this technology is discussed below.

Web Pages

The World Wide Web (WWW) is one of the most widely used parts of the Internet. The World Wide Web encompasses a global network of computer servers which provide information to users through a user friendly browser. The World Wide Web is one of the major reasons for the explosion of the Internet. This information can be provided in a variety of formats including text, graphics, sound clips, and video. The information is posted on Web pages. The pages are created using programming languages such as HTML, JAVA, and CGI scripts. Several excellent Web page generators, such as Microsoft's Frontpage, are also available. The user accesses the information through a client machine using a browser such as Microsoft's Internet Explorer or Netscape's Netscape 3.0.

The WWW is an interactive medium. Users click on hyperlink icons which then retrieves other pages or objects which may or may not be on this server. Thus, the medium is different than that of paper in that the user dictates the order of delivery of the information.

We have exploited these features of the WWW in our classes. We have posted our class notes, syllabus. practice tests, ancillary materials, and presentations on the WWW. Students perceived this to be extremely effective. The material is available to them in any setting at any time arranged in the order that they desire. Thus the student no longer is restricted to learning at a specific time in a specific room but rather learn when the time is best for them.

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Faculty also provide links on their pages to other sites. Effectively multiplying the resources to which the students are exposed.

Electronic Mail

Electronic mail is becoming more widely used across campuses nation wide and probably world wide. It's hard to experience the Web without quickly realizing the need for electronic mail or 'an e-mail address'. Students are entering college with experience in electronic mail. The ability to avoid printers, U.S. Postal service, and/or campus mail in addition to the costs associated with each is attractive to e-mail users. Many students interact socially in cyberspace through IRC (interactive real-time chat) and electronic mail. IRC allows the users to communicate through the keyboard at the same time or 'realtime'. Students can meet and communicate with other people from all over the world. The setup requires connection to the Internet and IRC software.

Listserves

Listserves are also used extensively across campus. They offer a group of people such as a class the ability to communicate through e-mail. The professor sets up and designates a name for the listserve such as 'CIS29301'. Then each participating member must subscribe to the designated listserve by sending the computer administrator an e-mail message stating their intent to subscribe. The subscription is confirmed by a return e-mail giving the e-mail address of the listserve and the student is subscribed. Now anyone can send an e-mail to this listserve address and every subscriber will receive the same e-mail message. This have proven to be an effective way for the professor to broadcast related course information to the class. Questions can be sent to the listserve for students to respond to. Class size can be a factor in how one might utilize a listserve, since each member receives every e-mail sent. For example, if 60 students are subscribed to the listserve and everyone is required to respond to a question once, each student will get 59 e-mail messages.

Students use the listserve for completing homework. If they are needing assistance after hours they can send an e-mail to the listserve stating the problem(s) they are having with the homework and ask for help from other students. Once students participate in several listserves they start to use them more. Our students will frequently come across related information to the course and send it to the listserve. Our faculty has realized the effectiveness of listserves and the students seem to appreciate the extra communication exchange.

Web Phones

Web phones such as Microsoft's Netmeeting (the second beta release of Netmeeting 2.0 is now available for free download at http://www.microsoft.com/netmeeting) and Netscape's Cooltalk (available at http://www.netscape.com) offer the ability to communicate with or without audio in real-time using your Internet connection.

Netmeeting conferencing software version 2.0 is the latest release of the standards-based, real-time multimedia communications client for the Internet. Netmeeting 1.0 was the first real-time communication and collaboration client for the Internet to support Internet telephony functionality and to feature standards-based multipoint data-conferencing capabilities based on the International Telecommunications Union (ITU) T. 120 standard. Netmeeting 2.0 adds support for standards-based audio and video conferencing based on the ITU H.323 standard, making it the first real-time Internet communications client that supports standardsbased audio, video, and data capabilities. Support for the H.323 standard enables users of NetMeeting to call, connect, and communicate with users of other H. 323compatible products and services. The setup requires both sender and receiver to be connected to the Web and the Web phone software to be installed on both ends. Audio with sound card, speaker, and microphone is optional.

Currently most connections only allow one-way transmission and depending on the speed of the computer system and modem the lag time tends to detract from the flow of the conversation. But the

options for communication between faculty and students and instructional purposes are numerous. By sharing an application running on their co.mputer, many people can participate in a conference to work together on documents or other group efforts such as collaborating on research, exchanging graphics and diagrams with an electronic whiteboard, transferring files, or communicating using text-based chat.

Several professors are using NetMeeting in their Instructional Television (ITV) courses . One example would be disseminating a file (any windows application file) to be used during class. Before class, the professor establishes a conference by calling the facilitator on the web phone at the site and uses the 'File Transfer' feature to send the file(s). When students arrive they get on their computers and ask to join the conference. So eventually the whole class is one single conference. Since NetMeeting is also groupware software, everyone can add their comments inTealtime to the file for on-line collaborative learning. Any one of the participants in the conference can choose to take control of everyone's screen to demonstrate an idea or a concept. This feature is called 'Collaborate' from the 'Tools' menu. They might use the 'Whiteboard' feature, which is similar to Windows' Paintbrush application, to draw or type ideas. Any windows application you have available (Excel, PowerPoint, Calculator, etc.) can be viewed by everyone in the conference. This feature is called 'Share Application' from the 'Tools' menu.

Also, the faculty can have 'virtual office hours' for students off campus. Just as regular office hours are designated virtual office hours could also be set up. During the virtual office hours, the faculty member would be available on-line for real-time interaction with the students using the previously mentioned features. We are just starting to explore the many uses of Web phones and workgroup software as an instructional tool. As technology continues to improve in the transmission and video areas, Web phone and workgroup software will become an even more widely used instructional and communication tool.

Newsgroups

A newsgroup is a public bulletin board where users with Internet access can read, reply to, and post messages for everyone to see. More than 15,000 newsgroups are available covering any topic you can imagine.

To participate in one of these newsgroups you will need a newsgroup reader. The reader allows you to follow threads (messages and their replies), automatically download messages, stitch together multipart file attachments, and more.

Most Web browsers have a built-in newsgroup reader, but these readers can't match the capabilities of a standalone reader. A good newsreader has strong organizational tools, intelligent attachment handling, and strong filters that separate the useful articles from the useless ones. One of the better standalone newsreaders is Free Agent, based on reviews of the best newsreaders provided by C/Net. These reviews can be found at the following URL:
http://www.cnet.com/Content/Reviews/Compare/Readers/index.html.

Before your newsreader will work, you must enter information in the Options Menu under the Mail and News Preferences. It will need to know the names of your incoming an~ outgoing mail servers and your news server. You will also have to enter your email address and user name. If using newsgroups for a class assignment in a lab environment, you should stress the importance of updating the information in the Options Menu every time the students use a newsgroup. They should also delete their information in the Options Menu after their final posting if there are multi-users of the computer. This assures that the next person on the computer does not use your identity information to post a message.

To read more information about newsgroups, access the Internet presentation "Everything You Need to Know about Viewing Newsgroup Articles and Pictures" at the following URL:
http://www.hobsonsquare.com/ngmenu.htm. The following topics are discussed within this Internet presentation:

1. Introduction to Newsgroups http://www.hobsonsquare.com/ngintro.htm

2. Basic Setup Steps Gaining Access to a News Feed: http://www.hobsonsquare.com/nga.htm.

3. Understanding the Elements of a Newsgroup Header: http ://www.hobsonsquare.com/ngb.htm.

4. Acronymns, Terms, Smiley Guide: http ://www.hobsonsquare. com/ngk.htm

5. Browsers, Decoders, Viewers, News Readers, Utility Software:
http://www.hobsonsquare.com/ngm.htm.

Once you have learned some of the basic information about newsgroups, you may want to try the search engine DejaNews to search for newsgroups and postings that interest you. More than 800 megabytes, equivalent to over 300,000 pages of text, is posted to newsgroups every day, so you can imagine how difficult it could be finding the information you want. DejaNews maintains an archive of over 53 million articles dating back to June 1995. You can search these articles using specific keywords, or you can create a query filter to search for certain newsgroups, dates, authors, and subjects.

Newsgroups Assignments for Business Classes

Business instructors can use newsgroups for various purposes. They can serve as a platform for students to share information and express their opinions. Instructors may use them to review for a test or to answer a question about any topic. The following sections will explain each of these uses in more detail.

Sharing Information

Students may be having difficulty finding secondary sources for a report assignment. In the past we have had each student post an abstract to the class news group for one or two of their best secondary sources. They include a reference entry for the source and a two- to threeparagraph summary of its contents. Then, if the source is an Internet page, they provide a link so that readers can access the secondary source right from the news group posting.

Students often have problems with a long-term assignment, and the news group can serve as a platform for presenting and discussing these problems. For example, if a student is experiencing difficulty writing a conclusion criterion for an analytical report, the student could 6 place his/her version in a newsgroup posting asking for help, and classmates could reply suggesting how the criterion needs reworded or quantified.

The newsgroup can be an effective forum for students to express their opinions. Our business communication students are in a computer lab for one class a week. Much time can be w asted as we wait for all students to arrive so that class can formally begin, or after students have finished a writing assignment at various times at the end of class. To make good use of this down time, you can have students post an message to the newsgroup answering a question that allows them to share their opinions. For example, the instructor could ask for the students' opinions on how the writing assignments could be made more interesting to them, or what gave them the most trouble with the writing assignment they just finished. Students tend to be more open and honest in expressing their opinions in a newsgroup versus face to face, even though in the long run a much larger audience exists.

Reviewing for a Test

A very popular newsgroup application is a test review. We place test questions as a series of postings on the newsgroup. Each question is set up as a separate posting. If you place all questions in one article, students tend to just print the posting and not participate in the review. Students are then assigned one question that they must answer. They reply to the original posting with their answer.

We include short objective questions such as true or false and multiple choice questions in the review. However, along with their short answer, the students must write a paragraph justifying their answer including definitions, what part of a false statement was incorrect, or what was wrong with the statements not chosen in a multiple choice question. Of course, students can read other students' postings and reply indicating if they think the question is incorrect and how they would change the answer. If the

activity is effective, a series of replies will appear for many of the questions. A few days before the test, the instructor may want to post a final reply for each question indicating the correct response.

Answering Questions

Newsgroups serve as a source for answering just about any question that comes up. For example, our business education students were curious about the difficulty of the national teacher's exam. Through the search engine DejaNews, we found several postings in the k12.chat.teacher newsgroup in which teachers give advice for studying for the test. These are just a few of the classroom applications that can be carried out effectively through a newsgroup.

Other

In addition to the technology related classroom application discussed above, all computer labs on campus are connected to a network drive, designated as read-only, for the professors to place assignments and a write-once and no read rights drive for the students to save their homework assignments. Each professor has their own password and folder with directories for each class taught. This allows the professor to hand out and collect assignments via the network. Access from home to these network drives is not currently available due to security concerns. However, some faculty members are experimenting with remoting software such as PC Anywhere connected to modems to access their office computers from home. This type of remoting software allows you work on your of fice computer as if you were sitting at your of fice computer with all the same rights and drive access that is normally available to you. Because as file sizes continue to grow, the ability to take student assignments home to grade becomes increasingly more difficult.

Summary

We believe that technology has greatly enhanced our teaching by improving the communication between the faculty and the student and between students. Students have begun to expect the use of technology in their classes to the point that they inquire as to what is the address for the class WEB pages and what is the name of the class newsgroups. At ENMU we have seen a very positive reaction to technology by both the students and faculty.

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